

OHIO ASCOMYCETE NOTES I. ON *ELEUTHERASCUS* *LECTARDII* (NICOT) VON ARX^{1, 2}

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ABSTRACT

Eleutherascus lectardii (Nicot) von Arx, isolated from soils of Clark County and Franklin County in Ohio, is apparently reported for the first time in the United States. It is characterized by spiny, brown ascospores and by elliptical or ovoid asci. The asci are without a peridium and are mostly eight-spored.

While studying the microfungal flora of Ohio soils, an ascomycete of morphological and evolutionary interest was encountered—*Eleutherascus lectardii* (Nicot) von Arx. This ascomycete, characterized by having one, two, or many asci that are without a peridium, is apparently unreported for the United States.

Four isolates of the organism were obtained from two soil samples collected 1–2 cm below the surface of the ground from two different localities: (1) three miles north of Springfield, along Route 68, Clark County, and (2) one mile south of Columbus, along Route 23, Franklin County. The dominant species of higher plant with which the ascomycete was associated were *Platanus occidentalis* L. and *Fraxinus pennsylvanica* Marsh var. *subintegerrima* (Vahl.) Fern. in the first locality and, in the second locality, several unidentified taxa of grasses.

The following description is based on isolate H1301 from soil of Clark County. The three other isolates were identical with H1301.

Eleutherascus lectardii (Nicot) von Arx

(figs. 1–6)

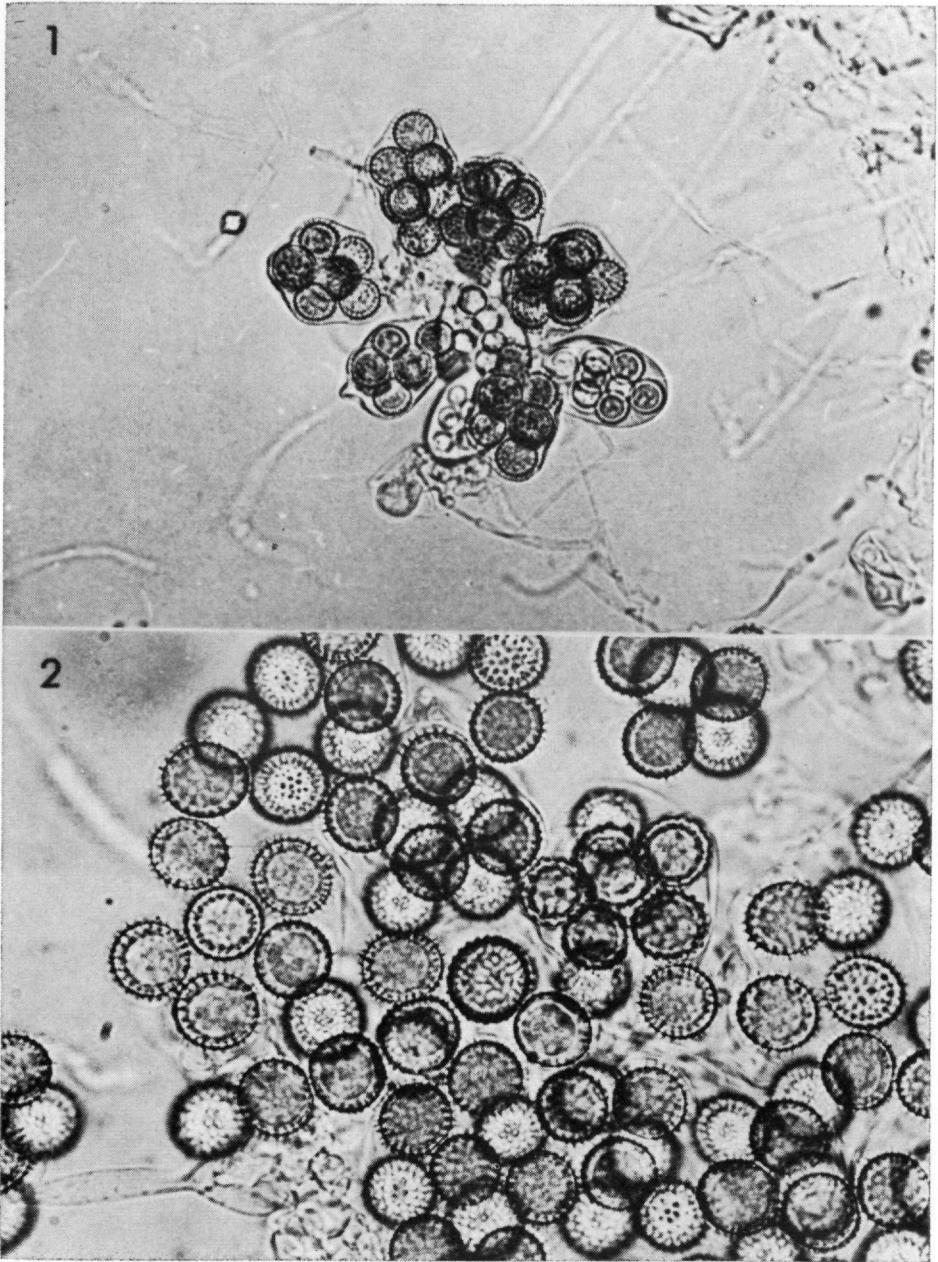
Vegetative hyphae hyaline, septate, branched, and up to 7 μ in diameter; ascus initial (fig. 4), consisting of the coiling of two morphologically similar branches which arise from the same hypha or different hyphae; clusters of asci minute, hemispherical to subglobose, up to 300 μ in diameter, scattered or gregarious, submerged in medium, hyaline at first, becoming dark brown at maturity, without a peridium; asci (figs. 1, 3, 4) developing on the submerged hyphae and remaining exposed at maturity, one, two, or many per cluster, elliptical, ovoid, or broadly clavate, 35–48 x 22–35 μ , mostly 8-spored, occasionally 2-, 4-, or 6-spored, with a persistent wall, with or without a short stipe, with or without a few non-septate hyphae 28–48 μ long and 3–4 μ wide arising from the base of the asci, not differing from the vegetative hyphae; ascospores (fig. 2, 5) globose to subglobose, 9.5–13 μ in diameter excluding the spines, hyaline at first, then pale brown and becoming brown at maturity, ornamented with regularly spaced spines 1.0–1.5(–2) μ long.

Colonies growing moderately fast on regular laboratory media, reaching 5 cm on cornmeal agar (CM), 9.3 cm on Czapek-Dox agar (Cz), and 8.5 cm on malt-extract agar (M) in 3 weeks at room temperature; on CM white, mycelium floccose at the center, hyaline and appressed towards the margin; on Cz white, loosely and lowly floccose; on M white, floccose with a thin edge, reverse colorless; asci produced abundantly on CM and Cz, submerged in the media, appearing as brown dots or strips.

The ascospores may occasionally have unusual variation in size and sculpturing. They may measure up to 17 μ or as low as 7 μ in diameter. Furthermore, they may possess three interesting sculpturing patterns: warted, ridged, or reticulate (fig. 6). Within a given ascus, only a single odd pattern was present on the

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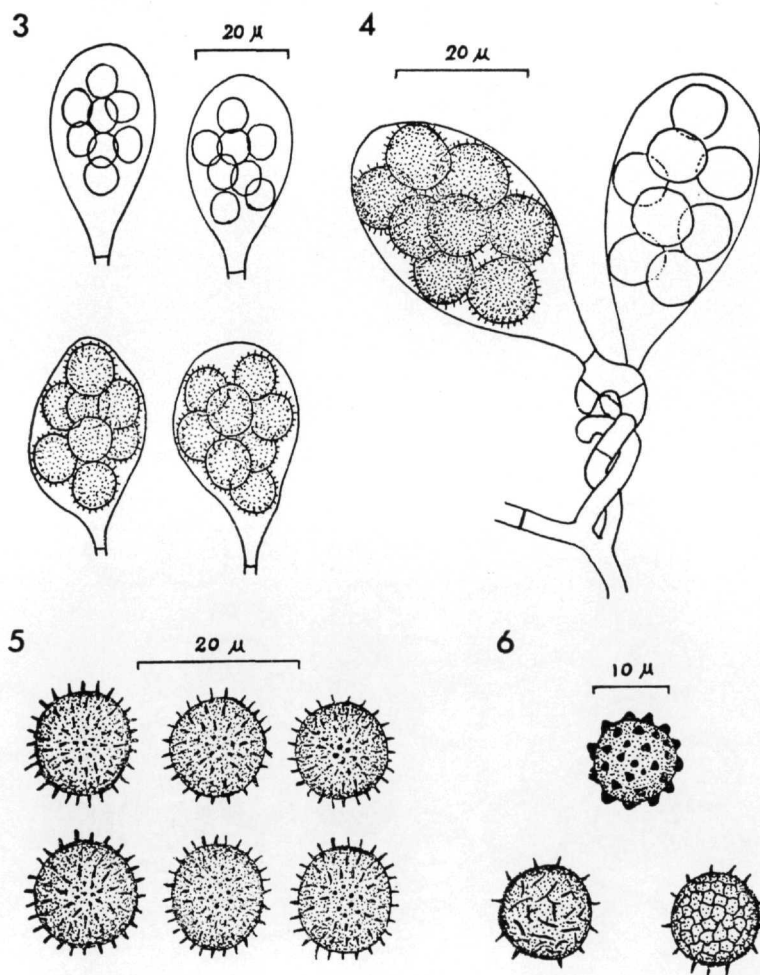


FIGS. 1-2. *Eleutherascus lectardii*. 1. Asci, $\times 550$. 2. Ascospores, $\times 1000$.

ascospores. These odd ascospores occur rarely and are observed to be present, along with regular ones, in only a few asci.

Certain members of the Sordariaceae also may vary in the number of ascospores per ascus and in the size and sculpturing of ascospores. Typically, asci of *Pleuraea curvula* Kuntze [= *Podospora curvula* (de Bary) Niessl] are eight-spored, but Moreau (1953) also observed asci of this species with 7, 6, 5, 4, or even 2 spores.

Mirza and Cain's (1969) illustrations showed that asci of *Podospora tetraspora* (Winter) Cain may be three- or five-spored. In a study of *Echinopodospora sacchari* Robison, which normally produces spiny ascospores, Robison (1970) reported that giant or spineless ascospores had been noted occasionally. While of relatively infrequent occurrence, these unusual variations are of genetic interest. In the case of *Eleutherascus lectardii*, the ascospores ornamented with a given kind of sculpturing pattern may be genetic segregants of mutations.



FIGS. 3-6. *Eleutherascus lectardii*. 3. Young and mature asci. 4. Ascus initial. 5. Ascospores. 6. Unusual ascospores.

From the viewpoint of ascus ontogeny, *Eleutherascus lectardii* is related to the Gymnoascaceae. Nicot (Nicot and Durand, 1969) described *Arachniotus lectardii* on the basis of an isolate from soil in Moselle, France. Their assignment of the fungus to *Arachniotus* was supported by the asci having a similar origin to that in other members of the genus (Durand, 1969). From a study of the type strain of *A. lectardii* deposited by Nicot in the Centraal Bureau voor Schimmelcultures, Netherlands, von Arx (1971) concluded that Nicot's fungus is not congeneric with

Arachniotus. He erected a new genus *Eleutherascus* and made a new combination, *E. lectardii* (Nicot), to accommodate the fungus. Von Arx considered that *Eleutherascus* has no affinity to the Gymnoascaceae. The considerably larger ascospores and the lack of peridium were used to distinguish this genus from other genera in the family. With regard to its taxonomic position, von Arx (1971) suggested that *E. lectardii* might represent a primitive discomycete without an ascocarpic envelope.

Microscopically, *Eleutherascus lectardii* resembles species of the discomycete genus *Ascodesmis* in the shape of the asci, and in the size and sculpturing of the ascospores. However, *E. lectardii* differs from members of *Ascodesmis* in the lack of an operculum on the ascus, in the lack of paraphyses, and in the irregular number of ascospores per ascus. It is of interest that the number of ascospores per ascus in *E. lectardii*, as in species of the discomycete genus *Tuber*, is irregular, a very rare feature in this group of fungi.

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